FIG. 1
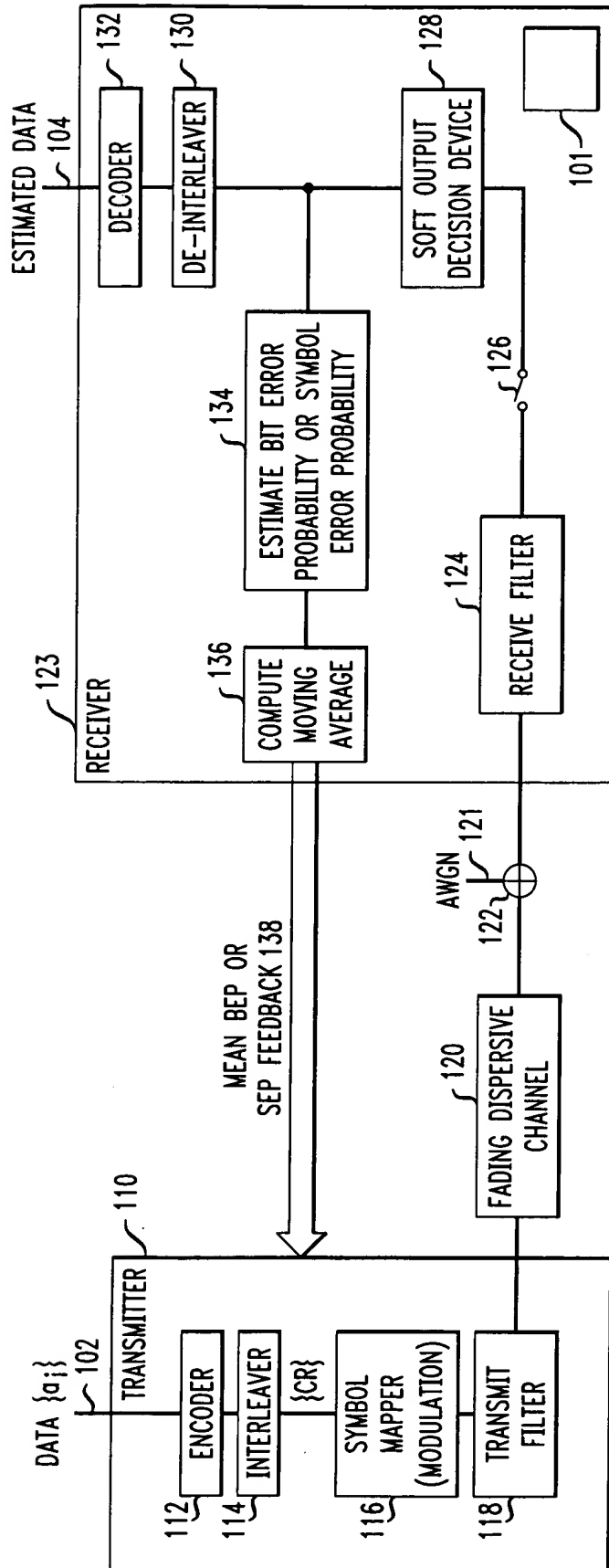BLOCK DIAGRAM OF SYSTEM

AWGA – ADDITIVE WHITE GAUSSIAN NOISE
MAP – MAXIMUM A POSTERIORI (BCJR – BAHL, COCKE, JELINEK AND RAVIV [3])
SOVA – SOFT OUTPUT VITERBI ALGORITHM
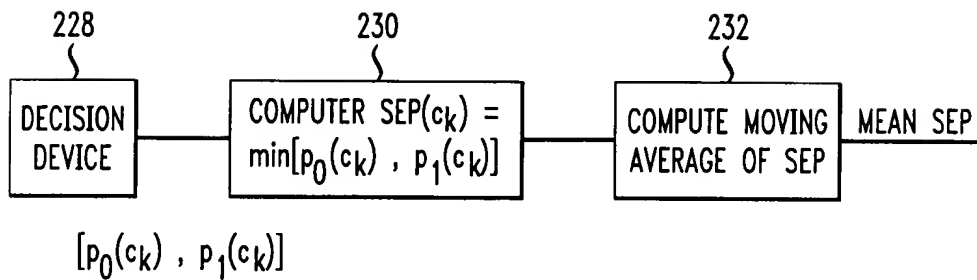
FIG. 2
COMPUTATION OF MEAN SEP (METHOD 1)

228 — DECISION DEVICE

230 — COMPUTER $SEP(c_k) = \min[p_0(c_k), p_1(c_k)]$

232 — COMPUTE MOVING AVERAGE OF SEP — MEAN SEP

$[p_0(c_k), p_1(c_k)]$

FIG. 3
COMPUTATION OF MEAN SEP (METHOD 2)

328 — DECISION DEVICE

330 — COMPUTE $SEP(c_k) = \min[1/(1+\exp(r(c_k)), 1/(1+\exp(-r(c_k)))]$

332 — COMPUTE MOVING AVERAGE OF SEP — MEAN SEP

$r(c_k) = \log(p_1(c_k)) - \log(p_0(c_k))$

FIG. 4

USE OF MEAN BEP OR SEP FOR RATE
ADAPTATION AND POWER CONTROL

TRANSMITTER / RECEIVER

| COMPARE SEP OR |
| TO PREDETERMINED |
| THRESHOLDS |

MEAN SEP OR
BEP FEEDBACK

RECEIVER /
TRANSMITTER

TRANSCEIVER 2

TRANSMIT POWER, CODING
AND MODULATION SCHEME,
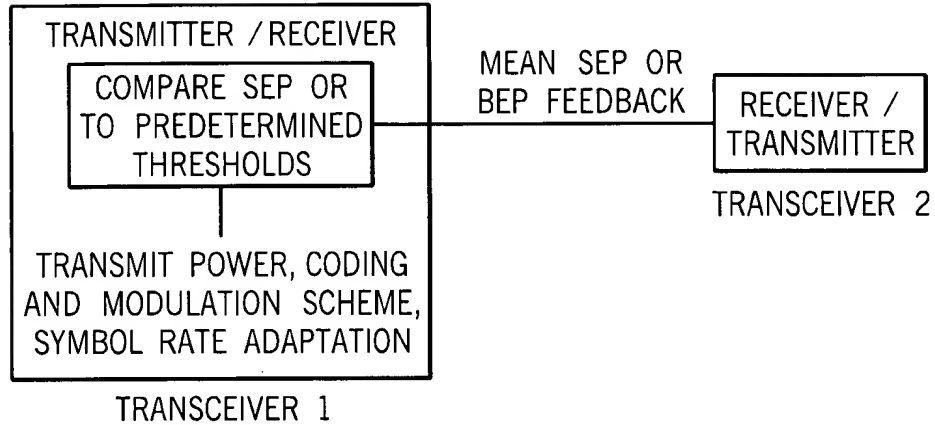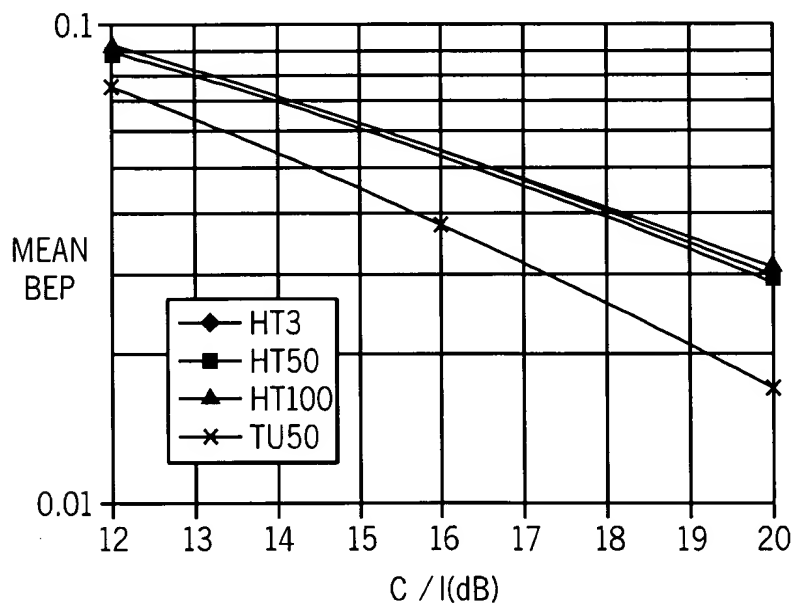SYMBOL RATE ADAPTATION

TRANSCEIVER 1

FIG. 6

MEAN BIT ERROR PROBABILITY ESTIMATE FOR DIFFERENT ENVIRONMENTS AND
MOBILE SPEEDS; HT3 REPRESENTS THE CHANNEL MODEL FOR A MOBILE
SPEED OF 3 km /h IN A HILLY TERRAIN ENVIRONMENT

MEAN BEP vs C / I(dB)

Legend:
- ◆ HT3
- ■ HT50
- ▲ HT100
- ✕ TU50

FIG. 5

500

RECEIVE M-ARY SYMBOLS OVER CHANNEL — 502

DETERMINE SOFT DECISION METRICS FOR M-ARY SYMBOLS — 504

DETERMINE SYMBOL OR BIT ERROR PROBABLITY — 506

DERIVE MEAN ERROR RATE ESTIMATE — 508

FEEDBACK MEAN ERROR RATE TO TRANSMITTER — 510

COMPARE MEAN ERROR RATE TO THRESHOLDS — 512

ANY THRESHOLD EXCEEDED ? — 514

NO

YES

SELECT NEW COMMUNICATION PROTOCOL — 516

INFORM RECEIVER OF NEW PROTOCOL — 518